

+ VI.—On *Lanius excubitor* and *Lanius major*.
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IN the eighth volume of the 'Catalogue of Birds in the British Museum,' Dr. Gadow has established, under the genus *Lanius*, a number of species more or less closely allied to *L. excubitor*, all of which are kept distinct with definite specific characters, in part new or amended by the author. But these "species" will, I have little doubt, ultimately prove to represent partly mere climatic races, originating in all directions from one typical species, and which, by various transition-stages, are ultimately connected, partly mere individual varieties, the origin of which, as a rule, cannot be shown to have any definite relation with age, locality, or the season of the year.

In the following pages I propose to offer a few remarks concerning the well-known form described in Gadow's Catalogue (p. 239) under the name *L. major*, Pall., the right of which to be regarded as a true species by the side of *L. excubitor* has, in all probability, been treated of oftener than any of the other forms, has been admitted by many, and disputed, perhaps, by more.

This question would seem to have occupied the attention of ornithologists more especially since Cabanis, in 1873 (Journ. f. Orn. 1873, p. 75), recorded an individual killed near the Wolga, in which he recognized Pallas's *L. major*, and which, to the best of his knowledge, was the first obtained in Europe. It is a well-known fact that, in the following years, accounts appeared of other examples of the said species or form, stating it to have been long known in European museums, nay, to be even of frequent occurrence.

Here, too (Norway and Denmark), the subject has been treated of and brought under discussion. Whereas Dr. Stejneger, in 'Archiv f. Mathematik og Naturvidenskab' for 1878 and 1880 (Christiania), keeps the two forms apart as separate species, I have, in the volume of the same journal for 1879, endeavoured to show that the presence or absence of the white bases on the secondaries affords no manner of

guidance; and hence that *L. major* does not admit of being distinguished by reliable characters from *L. excubitor*. When prosecuting my investigations, I had before me, as seen in the woodcuts furnished (p. 275) in the said journal, individuals from the southern districts of Norway, comprising alike the most typical specimens of *L. major*, in which the secondaries exhibit no traces at all of any white bases, and others in which the first indications of such a basal mark had made their appearance; furthermore, individuals with the said indications expanded to a distinct spot of about 15 mm. in breadth. Such individuals we might, with perfect indifference, term *L. major* or *L. excubitor*.

From these transition-individuals we have an unbroken series till the inner spot on the secondaries becomes the white mark in the "typical *L. excubitor*." Similar transition-series, or individuals, have been shown to occur by Mr. Seebohm (*Ibis*, 1880, p. 185), by Dr. Finsch (*Verh. k.-k. zool.-bot. Ges. Wien*, 1879, p. 188), and by various other ornithologists.

Dr. Homeyer, in particular, has dwelt most emphatically on this subject (*Journ. f. Orn.* 1880, p. 178), and few, if any, authors have hitherto had so extensive a material on which to base their researches, since that ornithologist was enabled to submit at one time as many as sixty-three specimens of *L. major*, *excubitor*, and *homeyeri* to minute comparison. But even had the whole intervening series been wanting, it would still be impossible to retain the single-marked form as a separate species.

As I have previously stated (*Arch. f. Math. og Naturv.* 1879, p. 279), Mr. Meves, of Stockholm, has, in his collection, two young birds, both shot Aug. 12th at Quickjock, in Lapmark, which he has reason to believe were of the same brood. One of these is a double-spotted male (*L. excubitor*), the other a single-spotted female (*L. major*). Now, that these birds were really hatched together, it would seem, from the comparatively advanced season of the year, difficult to decide; they had, most likely, already moulted their nest-plumage, and may have belonged to different broods.

In the summer of 1884, when on the Dovre Fjeld, I made an observation, concerning which there can be no question whatever. On June the 30th, I came across, in the uppermost pine-forests near Hjerkin (a locality well known to English tourists), a family of Shrikes, comprising, along with the parent birds, a whole brood of young ones just fledged, and habited accordingly in their peculiar nesting-plumage. As with all young birds, the feathers in this dress were soft and loose, though grown to their full length. Of these young ones, which had unquestionably been hatched together, I shot three; the rest flew off in company with the parent birds into the forest.

Two of those killed were males and in every respect typical specimens of *L. excubitor*, the spot on the secondaries being large and snowy white, with the normal length of 26 mm., in one even 27 mm. The third example, a female, was an equally typical specimen of *L. major*, not having the faintest trace of any white bases on the secondaries.

In other respects, the differences between these three individuals were slight in the extreme; the female and one of the males exhibited a somewhat darker tone on the back than did the other male, which had a clear pearly-grey tint, precisely as in very old and rich-coloured specimens. The brownish-grey edgings observable in most individuals towards the fall of the year were almost wanting in the two males, but distinct in the female. The underparts were alike; in all of them the vermiculations on the loose downy feathers were not sharply defined, as is often the case in the autumn and winter plumages of young birds, but narrow, closely arranged, and broken up, as it were, into points; more especially on the breast and the sides of the neck there was nothing left but the points. The black spot on the first tail-feather was large in the female (about 35 mm.), in one of the males normal (about 20 mm.), in the other small and on one side separated by the white colour.

Last summer (1885) I made a similar observation in Finmark, and shot from a nest a male and a female, of which the former was in every respect a typical specimen of *L. ex-*

cubitor, the female a single-spotted *L. major*, without a trace of any inner spot on the secondaries. On June 30th, when, in company with Mr. Landmark, Director of the Salmon Fisheries, I visited Finmark, I found near the Tana-Elv a Shrike's nest containing six young. It was placed in a birch tree on a sterile terrace, thinly grown and clad with lichens, about fourteen English miles from the mouth of the river. The nest was easily seen, and constructed of dry twigs together with straw, thickly lined with white feathers of the Willow-Grouse, as also a little wool and the cotton of *Salix lanata*. The inner diameter of the nest measured 90 mm. The young were of about the size of Sparrows and remarkably naked, only a few sprouting feathers being visible, but not a trace of down.

The parent birds displayed great anxiety and were easily shot. The male proved to be a normal *L. excubitor*, with exceedingly pure colours, and had not a trace of vermiculations on the white abdomen; the female was an equally typical specimen of *L. major*, and exhibited, on the whole, somewhat darker colours than the male; thus, the rump was but very little lighter than the back, whereas in the male it was a pure white. The measurements were as follows:—♂. Total length 271 mm., wing 117 mm., tail 114 mm. ♀. Total length 257 mm., wing 113 mm., tail 113 mm.

Hence, having examples to show, both that the single- and the double-spotted form may occur, pure and typical, in one and the same brood, and also that the two forms pair together, it seems difficult to defend the retaining of "*L. major*" as a species distinct from *L. excubitor*. In order to show to what remarkably wide extent this species is found to vary, I will enumerate below the twenty-six specimens of *L. excubitor* from Norway now preserved in the Christiania University Museum. Most of these were shot or collected by myself; and hence the sex, date, and exact locality can be given for well-nigh all. The specimens could, I feel sure, be arranged with equal correctness in seven as in two different categories.

A. SPECIMENS IN SPRING PLUMAGE (March to May).

a. Typical *L. excubitor*.

One male.—No vermiculations; basal spot on secondaries large (29 mm.). Aker (Christiania), 2nd March, 1877.

Two females.—One without, the other with, faint vermiculations; basal mark on secondaries normal (in ♀ short, 18–20 mm.); the white on first feather impure, being mixed with black. Aker, 3rd May, 1881; 19th April, 1882.

b. Nearly typical *L. major*.

One male.—Vermiculations comparatively distinct; indication of basal spot on secondaries occurring as a short whitish-grey spot (10 mm.) on the third feather. Hamar, 17th April, 1885.

c. Typical *L. major*.

One male.—No vermiculations; basal spot on secondaries absolutely wanting; plumage worn, only a few new feathers. Aker, 24th April, 1881.

One female.—No vermiculations; basal spot on secondaries indicated only by an almost imperceptible sprinkling of white on one single feather. Aker, 1st May, 1881.

d. Intermediate between *L. excubitor* and *L. homeyeri*.

One male.—Abdomen and rump entirely white; first tail-feather white, with the quills black in the middle; basal spot on secondaries long (30 mm.), extending beyond the coverts. Guldalen, near Throndhjem, 1st May, 1881*.

* This specimen approximates *L. homeyeri* more than *L. excubitor*. In *L. homeyeri* the rump is described by some authors (Ibis, 1881, p. 51) as grey, by the majority, however, as white—a striking proof of the difficulty with which the characters admit of being determined in this as in the other forms. In the specimen from Guldalen the said part and also the abdomen and the tips of the secondaries are snowy white; the inner basal spot on the secondaries reaches to the middle of the feathers.

Not improbably it was a similar individual that Seeböhm has recorded from Krasnoyarsk, and regarded as a hybrid between *L. leucopterus* and *L. excubitor* (Ibis, 1882, p. 421).

B. SPECIMENS IN SUMMER PLUMAGE (June to August).

a. Typical *L. excubitor*.

One male.—Abdomen snowy white, the rump of a well-nigh pure white; outermost tail-feather almost wholly white; basal mark on secondaries normal (23–25 mm.). Tana, East Finmark, 30th June, 1885.

b. Typical *L. major*.

One female (had paired with preceding specimen).—Faint traces of vermiculations; outermost tail-feather with a large and broad black spot; basal spot on secondaries absolutely wanting. Tana, 30th June, 1885.

C. SPECIMENS IN NESTING-PLUMAGE (June to July).

a. Typical *L. excubitor*.

Two males (hatched together).—Basal spot on secondaries normal (26–27 mm.). See above, p. 32. Dovre Fjeld, 30th June, 1884.

b. Typical *L. major*.

One female (of the same brood as the two before mentioned).—Basal spot on the secondaries absolutely wanting (see above, p. 32). Dovre Fjeld, 30th June, 1884.

D. SPECIMENS IN AUTUMN PLUMAGE (September to November).

a. Typical *L. excubitor*.

Five males.—One without vermiculations, and with a large basal spot on the secondaries (28–29 mm.); outermost tail-feather almost wholly white; perhaps an old specimen. The other four specimens with traces of vermiculations and the basal spot on the secondaries normal (26 mm., in one example 24 mm.) Aker, 8th Nov., 1876, 12th Nov., 1881, 13th Nov., 1884; Romedal, 4th Oct., 1884; Maalselven, near Tromsø, Sept. 1880.

One female.—Broad and distinct vermiculations; basal spot on the secondaries normal (18–20 mm.), its colour not quite pure; traces of vermiculations on the upper and lower tail-coverts. Aker, 4th Nov., 1881.

b. Nearly typical L. excubitor.

One male.—An unusually large and light-coloured specimen; total length 276 mm. Traces of vermiculations; basal mark on secondaries rather short (18 mm.), impure in colour, and mixed with black. Aker, 8th Nov., 1884.

c. Intermediate between L. excubitor and L. major.

One male.—Traces of vermiculations; basal spot on secondaries short (14–16 mm.), colour impure and mixed with black. Aker, 22nd Oct., 1884.

One specimen (sex undetermined).—Faint vermiculations; basal spot on the secondaries short (10–11 mm.). Odalen, Oct. 1868.

d. Nearly typical L. major.

One male.—Traces of vermiculations; faint indication of basal spot on second feather of the secondaries (8 mm.). Aker, 12th Sept., 1884.

e. Typical L. major.

One male.—No vermiculations; basal spot on secondaries indicated by an almost imperceptible sprinkling of white on a single feather. Hamar, 8th Nov., 1885.

f. Intermediate between L. excubitor and L. borealis.

One male.—Broad vermiculations on abdomen and upper tail-coverts; upper surface mixed with reddish grey; basal spot on secondaries short (14–15 mm.), colour impure; first ail-feather with the black spot large (41 mm.). Hamar, 5th Nov., 1881*.

* This specimen is hardly distinguishable from a female specimen of *L. borealis* from Nevada (28th March, 1868, Smiths. Inst.), the only example of that form at present in our museum, save in one respect, viz. that the Norwegian individual has a short basal mark on the secondaries, a character, perhaps, never met with in the true *L. borealis*. But the said mark is wholly concealed by the coverts, and if these are not moved aside the two examples would pass as absolutely identical. From my own investigations, I cannot venture to decide whether *L. borealis* also exhibits traces of a similar basal mark on the secondaries. In any case *L. borealis* can hardly be otherwise regarded than as one more link in the long unbroken series of varieties that *L. major* or *L. excubitor*—whichever form be taken as the original—sends forth in all directions.

E. SPECIMENS IN WINTER PLUMAGE (December to February).

a. Typical *L. major*.

Two males.—Traces of vermiculations. In one the basal spot on the secondaries absolutely wanting, in the other indicated by a white point (3 mm.) on a single feather. Aker, 21st Dec., 1872; 10th Feb., 1885.

L. excubitor, in its most typical form, *i. e.* having the two wing-spots well developed, therefore occurs at all seasons of the year, and in both sexes; this is the case even with young in the early autumn, nay, even in their first plumage ("nesting-plumage"), at least with the males.

In the autumn traces of the vermiculations become perceptible, save in the case of exceptional specimens (probably old birds). In the spring and summer the transverse bands, as a rule, disappear.

The size of the black spot on the outermost tail-feather varies exceedingly, but most frequently is smaller than in the dark form ("*L. major*").

A transition-form to *L. homeyeri*, or an individual exhibiting a surplus of white, was a male in spring.

"*L. major*," in its typical form, without the slightest trace of any basal spot on the secondaries, may likewise, it would seem, occur at all seasons of the year, and in both sexes, as also in the nest-plumage; the majority, however, have proved to be females.

The vermiculations across the abdomen are frequently retained in this form; they had, however, as with *L. excubitor*, disappeared in the two spring specimens—one a male, the other a female—and in one autumn specimen, a male. On the other hand, they were present in a female with summer plumage.

The intermediate forms have, as a general rule, been autumn examples; one only, approximating very closely the typical *L. major*, was a male in the spring. Of these autumn individuals, two stood equally near to both forms, one approximated closely the typical *L. excubitor*, and one exhibited a remarkable surplus of reddish grey (transition to *L. borealis*).

All these transition-forms (possibly with but one solitary exception) were males; also the last-mentioned variety.

The question as to when and in what condition these specimens of *L. excubitor*, either with no or with an imperfectly developed basal spot on the secondaries, are found to occur, can hardly at present be satisfactorily settled.

First of all, it is evident that the presence or absence of the basal spot on the secondaries cannot be dependent on age, since both single-spotted and double-spotted individuals belonging to the same brood occur even in the nesting-plumage.

Furthermore, should the varying colour of the secondaries arise from a gradual change, and the imperfectly developed basal spot in the course of the winter and spring become a perfect one (as with the primaries of *Plectrophanes nivalis*, which pass, without moulting, from brownish grey to white), a change in this respect would necessarily take place with such individuals also as exhibit a very small or no basal spot whatever on the secondaries, and not in transition-specimens alone.

Thirdly, sex exerts no decided influence, although single-spotted individuals are more frequently found to be females than males.

Finally, as regards the latitude, it is generally admitted that the single-spotted form (comprising also less typical or transition individuals) belongs to the northern or north-eastern tracts of the Palæarctic Region, whereas the typical *L. excubitor* inhabits Western and Central Europe. Meanwhile we must bear in mind that every year, now that attention has been drawn to the subject, more or less typical specimens of the single-spotted form (*L. major*, Cab.) are shown to occur regularly or commonly in most tracts along with the normal *L. excubitor*, extending to Austria and Hungary; while, as stated above, the true *L. excubitor* has also been found to inhabit and breed in the Arctic regions (Finmark). Other examples are recorded from Archangel (Meves), from the Ob (Finsch); and their number will assuredly increase every year.

Though, as yet, we are far from having obtained exhaustive observations, it would seem a fact that throughout the Eastern Arctic region the inner spot is wholly or in part suppressed oftener than is the case in the southern districts. This characteristic tendency increases with the distance east; in Eastern Asia the transition is probably imperceptible to the form which, under the name of *L. borealis*, we know from North America* (an exceptional approximation to this form occurs even in Western or Central Europe). In like manner does the transition proceed to other forms in which the white colour predominates, viz., throughout Southern Europe, North Africa, and East Asia.

Hence we must infer that *L. excubitor* (like *L. ludovicianus*, and other species of the same genus, if in a less degree) has a remarkable tendency to variation, more especially as regards the extent of the white colour on the tail-feathers and on the bases of the secondaries, as also in the development of the vermiculations across the abdomen. This variation occurs in some cases quite individually, in others more constantly, a definite kind of variation being exhibited with greater and greater frequency according as the distance from the region constituting the habitat of the typical form increases, till a number of more or less constant races, known to us under various names, at length are produced.

To enumerate all these varieties, or "species," derived from *L. excubitor*, does not come within the object of the present paper. In conclusion, I shall merely enumerate such of the forms as are found with greatest frequency in the tracts of the Palaearctic Region.

1. The typical form (*L. excubitor*, forma *excubitor*), with its fully and normally developed inner spot on the secondaries, inhabits chiefly Central and Western Europe, and produces normally young which, even in the nesting-plumage, exhibit this mark in full development, as in the old birds.

* "My immature bird from the Amoor is undistinguishable from *L. borealis*, Vieill., but I have seen an almost complete series from it to *L. excubitor*" (Seebohm, *Ibis*, 1880, p. 115).

2. Sometimes, however, among the normally coloured young are produced a few having the basal spot on the secondaries either imperfect or wholly wanting, and every conceivable transition between this and the typical form.

3. Such individuals, with the basal spot on the secondaries either imperfect or wanting, become more common throughout the Arctic region; and in Northern Asia these are the normal (*L. excubitor*, forma *major*), while the double-spotted variety occurs comparatively seldom.

4. At the same time that the basal spot on the secondaries is either in part or wholly suppressed, some individuals have a tendency to exhibit a buff colouring on the rump and tail-coverts (*L. excubitor*, forma *mollis*), also more distinct and permanent vermiculations across the abdomen, till in North America (*L. excubitor*, forma *borealis*) this character becomes normal.

5. Moreover the typical *L. excubitor* sometimes, too, produces individuals having the basal spot on the secondaries larger than in the typical form, while at the same time the white colour becomes more expanded on the feathers of the rump and the outermost rectrices (*L. excubitor*, forma *homeyeri*).

6. Such individuals, occasionally produced also in Northern Europe, become more frequent further south, till in South-eastern Europe they are normal.

7. This tendency to develop the white colour increases with the distance east, till the most pronounced form (*L. excubitor*, forma *leucopterus*) meets in South Siberia the northern and darker forms of the species mentioned above.

8. Assuming the observations from these districts to be trustworthy, the last form keeps throughout that region (Seebohm, 'Siberia in Asia,' p. 243) distinctly different from the others.

Christiania, 30th Nov., 1885.